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before the

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U. S. HOUSE OF REPRESENTATIVES

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Mr. Chairman and Members of the Committee:

I appreciate the opportunity to appear before you today. The Energy Information Administration (EIA) is the independent statistical and analytical agency within the Department of Energy. We are charged with providing objective, timely, and relevant data, analyses, and projections for the use of the Congress, the Administration, and the public. While we do not take positions on policy issues, our work can assist energy policymakers in their deliberations. Because we have an element of statutory independence with respect to our activities, our views are strictly those of EIA and should not be construed as representing those of the Department of Energy or the Administration.

Gasoline is an essential commodity to most Americans. Not only is our country the world's biggest petroleum consumer, but to a far greater extent than the world in general, we consume that petroleum in the form of gasoline. Gasoline accounts for about 45 percent of U.S. petroleum consumption, or about 18 percent of our total energy demand. Retail gasoline prices more than doubled from the beginning of 2004 through early September 2005, in the aftermath of Hurricane Katrina. Though gasoline prices fell back sharply last fall following initial recovery from the hurricanes, the U.S. average regular gasoline price is once again around $3 per gallon, with many areas already over that mark.

Several different factors have contributed to the sharp increase in the price of gasoline seen in recent years. First and foremost, the price of crude oil, from which gasoline and other petroleum products are refined, has risen dramatically. Second, the balance between the supply and demand for gasoline has tightened. As discussed below, both long-run forces, such as demand for gasoline growing faster over the past 5 years than the capacity to supply it, and shorter-run circumstances, such as the elimination of methyl tertiary butyl ether (MTBE) from reformulated gasoline (RFG) on a nationwide basis and the lingering effects of hurricanes Katrina and Rita on refinery availability and maintenance schedules, are contributing to this tightness. These factors combined to increase the "spread" between the average spot gasoline price and the spot price of crude oil from about 15 cents per gallon at the beginning of March to a peak of about 60 cents per gallon in the middle of April. This gasoline price spread has since fallen back somewhat, but

through March and April the spread averaged about 40 cents per gallon, about 20 cents per gallon higher than seen during more typical market situations during these months.

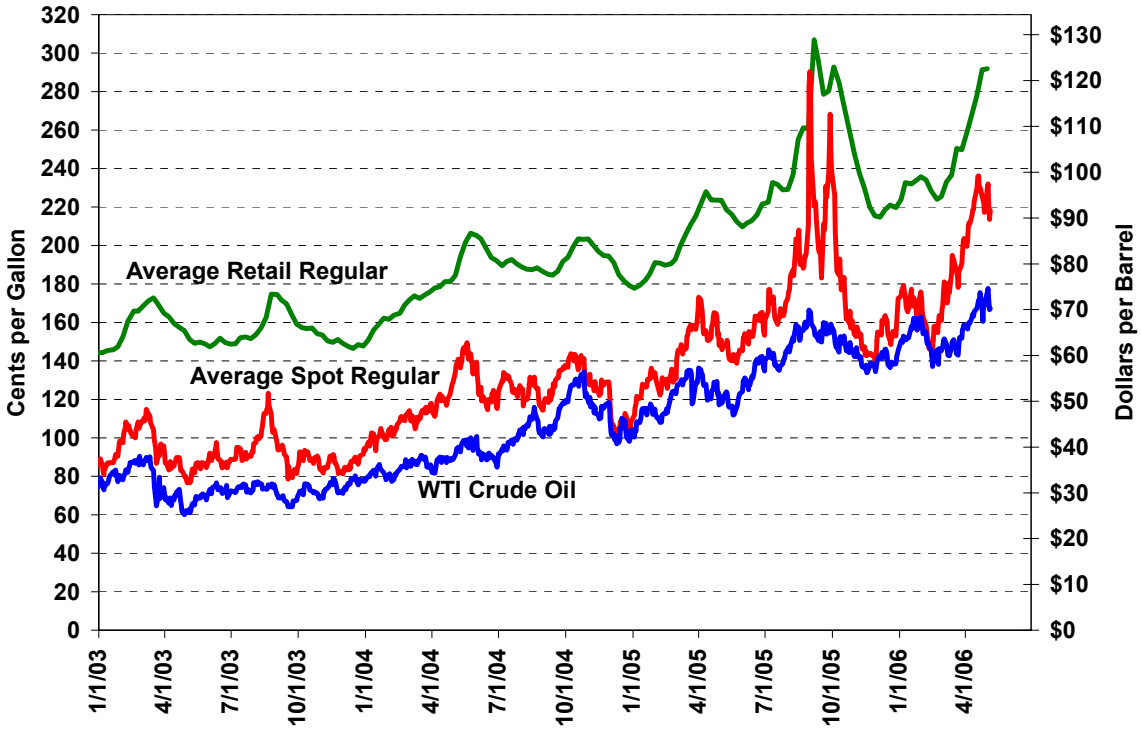
As requested in your invitation, my testimony discusses the factors affecting gasoline supply and prices, including the effects of fuel specifications and the increased use of ethanol on the market, and reviews EIA's gasoline market outlook.

Factors Affecting Gasoline Supply and Prices

Crude Oil Prices

The price of West Texas Intermediate (WTI) crude rose from roughly $40 per barrel at the end of 2003 to between $70 and $75 per barrel on the spot market during the first week of May 2006. Futures prices are also close to this level. All else being equal, each $1 increase in the price of crude oil adds about 2.4 cents per gallon to the price of gasoline. As shown in **Figure 1**, the increase in crude oil prices accounts for roughly two-thirds of the increase in the average retail gasoline price since the end of 2003.

Figure 1
CRUDE OIL, SPOT GASOLINE AND RETAIL GASOLINE PRICES, 2003 to Present



At this Committee's hearing May 4th on crude oil markets, EIA Administrator Caruso outlined our perspective on the forces driving crude oil prices in today's marketplace. To summarize briefly, crude oil prices are set in the global marketplace and largely reflect the fundamentals that determine supply and demand. In recent years, increases in global oil production capacity have struggled to keep pace with rapidly growing demand, particularly in China, the other emerging economies in Asia, and the United States. This slower growth in productive capacity relative to growth in demand has resulted in a decline in global surplus capacity to produce crude oil. At the same time, perceived risks to supply posed by geopolitical instability and other uncertainties have grown. In the present environment, with a minimal cushion of surplus upstream and downstream capacity to meet disruptions in supply and with futures markets in contango (i.e., a market in which prices for commodities delivered in future months are higher than for those delivered in months closer to the present), market participants have a strong demand for inventories, so the traditional inverse relationship between inventory and price levels does not apply. Absent an unexpected downturn in global economic activity, neither demand-side nor supply-side corrections will come quickly; thus, crude oil prices are expected to remain at relatively high levels, supporting high gasoline prices for the foreseeable future.

The Supply-Demand Balance in Gasoline Markets

Beyond the cost of crude oil to refiners, gasoline prices are directly affected by the balance between supply and demand for gasoline itself. The difference between gasoline prices at the refinery level and crude oil prices, often referred to as the "crack spread," reflects both the cost and profitability of refining gasoline and depends directly on market conditions. Historically, the price differential between crude oil and gasoline has varied significantly over time due both to seasonality and factors affecting market tightness. As with any commodity, when available production capacity is strained relative to demand, the price rises to keep the market in balance by attracting additional supply and/or discouraging consumption. As discussed below, both long-run forces and short-run circumstances have contributed to a tighter gasoline market, which has led to increased gasoline crack spreads.

Long-run forces affecting the gasoline market balance

U.S. gasoline demand has generally grown at the rate of about 1 to 3 percent per year since the late 1980s, driven by growth in population, the number of vehicles, and the economy. Gasoline demand growth can also be affected by changes in vehicle fuel economy and changes in gasoline prices. After rising from the mid-1970s to the late 1980s, the average fuel economy of new light-duty vehicles has been relatively flat over the past decade, in part due the growing share of light trucks (including pickup trucks, sport utility vehicles, and minivans) in total sales of light-duty vehicles. The impact of gasoline prices on consumption, which reflects both travel decisions and, over time, vehicle purchase decisions, is difficult to isolate from other influences, but appears to be growing in an era of sustained higher prices. Based on available data, U.S. motor gasoline consumption exhibited almost no growth in 2005.

U.S. gasoline supply comes mainly from domestic refineries, though with a significant contribution from imports. In the late 1970s, the United States had significant excess refining capacity, but a combination of growing demand and the closure of some refineries significantly raised average U.S. refinery utilization rates by the early 1990s. Since the mid-1990s, both demand and refinery capacity have grown, but demand has grown more than capacity over the past 5 years. This situation may be changing. Significantly higher financial returns to refining over the past several years have provided a strong incentive for refinery expansion. The refining industry is also completing a set of major process investments needed to meet low-sulfur fuel specifications that absorbed significant resources. With attractive returns and available resources, we are now seeing major capacity expansion announcements, totaling approximately 1.5 million barrels per day of new distillation capacity by 2010. However, much of this capacity will not be ready for several years, which leaves the U.S. market quite tight in the very near term.

In recent years, product imports have met about half of U.S. growth in gasoline demand. Product imports will remain important to the United States. About 10 percent of our gasoline supply comes from imports, most of which go to the East Coast where they supply about 25 percent of that region's demand. Much of the growth in U.S. gasoline imports during the past few years has come from European sources. An excess of gasoline supply in Europe, which derives from that region's move to diesel-fueled light-duty vehicles, has found a market on the U.S. East Coast.

Furthermore, European gasoline quality is similar to U.S. quality, so European refiners can produce gasoline that meets U.S. standards. Since 2003, European gasoline import volumes increased by over 200 thousand barrels per day (almost 80 percent), notwithstanding implementation of reduced sulfur content standards in the United States.

At the same time, the United States saw a drop in gasoline import volumes of 27 thousand barrels per day from Brazil, as that country and other areas have not moved as rapidly to low-sulfur fuels. In 2006, we may see further falloff from areas in Latin America and other regions as the United States has moved to the final phase of the Tier 2 gasoline program and the industry moves away from MTBE. In general, fewer sources of supply will be able to provide U.S.-quality imports. However, those remaining appear to have the potential to send increased volumes to the United States.

Short-run circumstances affecting the gasoline market balance

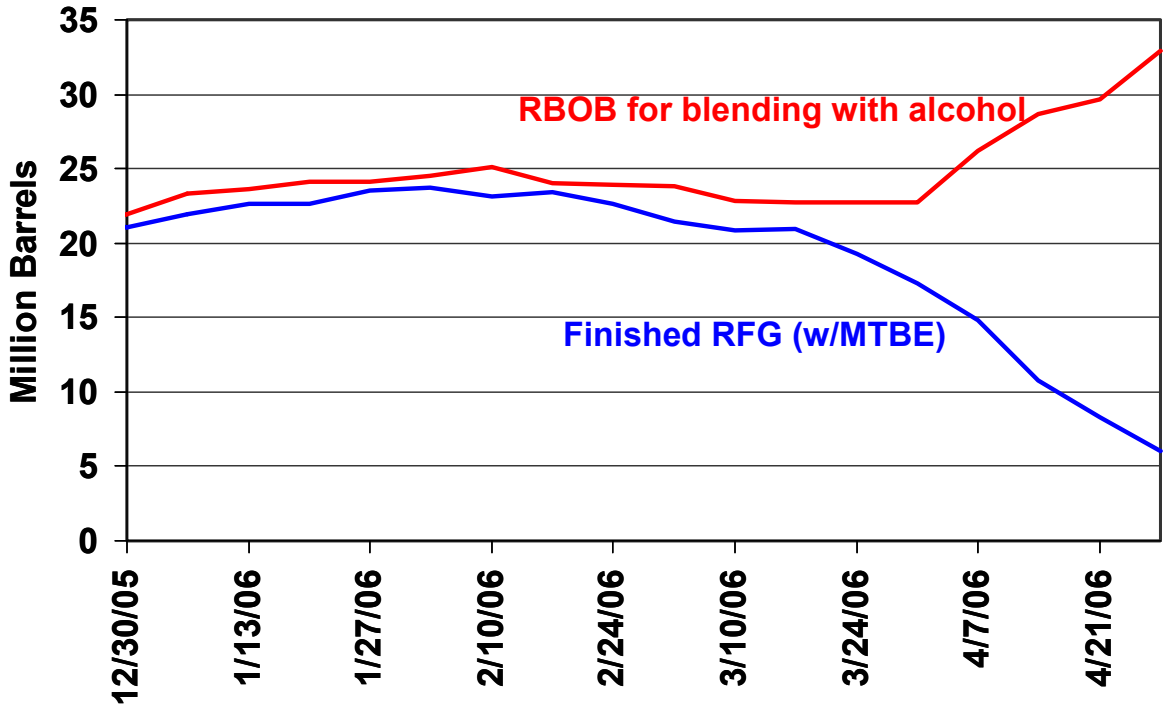
Since last fall, several events have exacerbated tightness in gasoline markets. One of these is the elimination of MTBE from RFG and the resulting increase in the use of RFG made with ethanol. The petroleum industry has moved to eliminate MTBE in gasoline by the first week in May 2006. Companies' decisions have been driven by State bans due to water contamination concerns, continuing liability exposure from adding MTBE to gasoline, and perceived potential for increased liability exposure due to the elimination of the oxygen content requirement for RFG as part of the Energy Policy Act of 2005.

Until recently, the largest use of MTBE was in RFG consumed on the East Coast, excluding New York and Connecticut, and in Texas. The other RFG areas in the Midwest, California, New York, and Connecticut had already moved from MTBE to ethanol. Most companies eliminating MTBE in the short run are blending ethanol into the gasoline to help replace the octane and clean-burning properties of MTBE. The switch from MTBE to ethanol in these RFG areas has several supply impacts:

- Net loss of gasoline production capacity. During the summer months, replacing MTBE with ethanol in reformulated gasoline results in about a 5-to-6-percent loss of production capability in order to accommodate ethanol's emission properties.
- Shift in East Coast supply sources. Without the use of MTBE, East Coast refiners are expected to produce less RFG, which will result in more RFG supply for this region coming from the Gulf Coast and from imports.
- Loss of import supply sources that cannot deliver MTBE-free product or that cannot produce the high-quality blendstock needed to combine with ethanol.
- Installation of blending equipment at terminals. Ethanol must be delivered separately to terminals near the retail market, where it is blended with base gasoline blending components before delivery to retail stations.
- A very tight ethanol market, limited in the short-run by ethanol-production capacity. Until ethanol capacity catches up, ethanol is being repositioned from discretionary blending into conventional gasoline in the Midwest to the RFG areas, and EIA expects some increase in imports.

Refiners, blenders, pipelines and ethanol suppliers have been working hard to accomplish the changeover. As shown in **Figure 2**, recent EIA weekly data show a steady decline in stocks of RFG with MTBE and a steady increase in stocks of summer-grade reformulated blendstock for oxygenate blending (RBOB with alcohol), the base gasoline into which ethanol is blended. The transition on the East Coast resulted in some temporary terminal outages as terminal tanks were emptied of winter-grade reformulated gasoline in preparation to receive the first batches of RBOB with alcohol. While the outages raised some concerns, no major shortage occurred. The largest problems have been in Texas, where rail bottlenecks are making ethanol delivery difficult. This problem is not yet resolved. Still, much of the initial transition is behind us, and EIA will continue to monitor the situation this summer.

Figure 2
RECENT GASOLINE STOCK LEVELS:
FINISHED RFG (w/MTBE) and RBOB (for Blending with Ethanol)



The other short-run circumstance affecting the current market is the lingering effect of hurricanes Katrina and Rita. The hurricanes resulted in significant damage to several refineries, and one large refinery suffered an explosion that has kept it off line through April. In addition major refinery maintenance has occurred this year as a result of, among other things, delayed maintenance during the fall following the hurricanes, and final preparations for the ultra-low-sulfur diesel program that begins this June. EIA estimated that about 1 million barrels per day of capacity was offline during April, which is almost 6 percent of U.S. capacity. These refineries represent about 500,000 barrels per day of gasoline production. Maintenance outages are expected to extend only into the middle of May, and the hurricane-damaged refineries are continuing to come back online, which should help to ease prices.

Impacts of Fuel Specifications

Apart from the current move away from MTBE as a blending component in RFG, the longer-term trend towards requirements for cleaner-burning gasoline and diesel fuel, while contributing to air quality improvement, has had several fuel supply consequences. In general, cleaner-burning motor fuels require more processing, are harder to produce, and restrict flexibility in using fuel components, which all work to increase their production cost. Some clean fuel requirements are imposed at the Federal level, but in many cases States and regions that are charged with developing plans to reduce emissions of air pollutants and pollution precursors in areas that do not meet ambient air quality standards adopt changes in fuel specification as one of their strategies. Such States and regions typically work with refiners to tailor gasoline specifications to meet their specific needs at minimum production cost. For example, some regions that are not required to use RFG have been able to reduce emissions of volatile organic compounds (VOCs), a smog precursor, by lowering the Reid Vapor Pressure (RVP) of gasoline used in their area to reduce evaporation. Such low-RVP fuel is cheaper to produce than gasoline that meets the complete RFG specification.

As the number of fuel types has increased, the pipeline distribution and storage system, which has a limited number of pipelines and storage tanks, is facing growing challenges to deliver many distinct fuel types in smaller batches. The reduction in the fungibility of fuels across locations has tended to slow the ability of the supply system to respond to unexpected shortfalls. If a region runs out of its specific fuel unexpectedly, it can take some time for new supply to be sent to the area. Different fuels available in the nearby surrounding areas could not be used. Delays in responding to such unexpected shortfalls add to price volatility. So far, this problem has not resulted in major problems in most regions. The two notable exceptions are California, which requires the cleanest-burning gasoline in the world, and the Chicago/Milwaukee area, which was the only region using ethanol-blended RFG during the change from Phase I to Phase II of the RFG program in 2000.

Looking ahead, unchecked fuel-type proliferation has the potential to make the distribution system even more complex and further reduce fuel fungibility, causing more regional supply and

price volatility than we have experienced historically. Yet, there is no simple solution. In addition to the difficulty of balancing of environmental and fuel supply concerns, actions to ease distribution problems by reducing the number of gasoline formulations could increase average gasoline production costs and reduce overall gasoline supply capacity. For example, moving the entire country to a single very clean gasoline standard would certainly enhance fungibility, but it would also impact U.S. refineries' ability to produce enough gasoline to meet overall demand. Considerable investment in what might otherwise be devoted to capacity expansion would be diverted to building the systems needed for more intensive processing. A single product standard for gasoline, if set at very stringent levels, could also choke off imports of gasoline from some sources. Even though greater fungibility would reduce the potential for short-term regional supply shortages and price spikes, consumers could end up facing a higher national average price for gasoline than they would under the present regime. Timing, balance between supply and distribution, and potential future fuel specification and vehicle changes all need to be considered when trying to address this issue.

Ethanol

The United States is moving towards using more renewable fuels, in particular ethanol. Most renewable fuel use historically and over the next decade is expected to be as additives to traditional petroleum fuels, rather than as stand-alone fuels. Use of ethanol has been increasing in recent years as States have banned the use of MTBE, and gasoline suppliers have replaced that MTBE with ethanol, which helps to replace the octane and clean-burning properties lost with MTBE. In 2005, ethanol use in gasoline (263 thousand barrels per day) represented almost 3 percent of gasoline consumption by volume. The recent Energy Policy Act of 2005 added a renewable fuel standard (RFS) that requires the increased use of renewable fuels over time and includes provisions to encourage biodiesel and cellulose ethanol.

Given EIA's short-term outlook for crude oil prices and the reference case oil price projections included in our *Annual Energy Outlook 2006 (AEO2006)*, we believe that there are strong prospects for growing ethanol use. Our reference case projection for renewable fuel use significantly exceeds the requirements of the RFS program, reaching roughly 10 billion gallons

annually in 2012, assuming the extension of the existing ethanol tax credit beyond its currently scheduled expiration at the end of 2010. Even without extension of the tax credit, projected ethanol use exceeds the RFS-mandated level through 2012 in our reference case. We are projecting that nearly all of the ethanol will be derived from corn, with cellulose ethanol limited to the penetration levels mandated in the recent legislation. While cellulose ethanol has potential feedstock cost advantages compared to corn ethanol and tremendous progress has been made in the performance and cost of enzymes used in the conversion of cellulose material to ethanol, the high capital cost of cellulose ethanol plants remains a significant barrier to their economic competitiveness.

The Near-Term Outlook

Looking ahead, the prospects for significant near-term improvement in the world petroleum supply and demand balance appear to be fading. While U.S. crude oil production will grow with recovery from the hurricanes, only small increases in Organization of Petroleum Exporting Countries (OPEC) and other non-OPEC production and capacity are expected in the near future. Expected steady world oil demand growth, combined with only modest increases in world surplus oil production capacity and the continuing risks of geopolitical instability, are expected to keep crude oil prices high through 2007. The WTI crude oil price in EIA's most recent short-term forecast is projected to average $68 per barrel in both 2006 and 2007. Retail regular gasoline prices are projected to average about $2.57 per gallon in 2006 and 2007. Gasoline demand is projected to grow 0.9 percent in 2006 and 1.5 percent in 2007. The projected growth in demand reflects continued economic growth and the leveling off of motor gasoline prices.

During this year's summer driving season (April 1 to September 30) the national average retail price of regular gasoline is expected to be $2.71 per gallon, 34 cents per gallon higher than last summer's average of $2.37 per gallon. By September 2006, fuel prices are expected to be lower than last year. With another active hurricane season possible this year, news of any developing hurricanes and tropical storms with a potential to cause significant new outages could add to

volatility in near-term prices. The projections outlined above do not reflect a scenario with significant new production or refinery outages.

This concludes my testimony, Mr. Chairman and members of the Committee. I will be happy to answer any questions you may have.